BOOK REVIEWS

Lectures on Quantum Mechanics

Edited by Gordon Baym, Published by W. A. Benjamin, New York
Pp xi + 594, 1969.

The present book consisting of a self-contained course in quantum mechanics, starting from the first principles to elementary relativistic one-particle mechanics, is suitable mainly at the postgraduate level of the Indian Universities. The author, presumes preliminary knowledge of the introductory concepts and basic postulates of quantum mechanics which are now-a-days taught at the graduate level of many Indian Universities and the book opens directly with a discussion on photon polarization to bring out the essential features of superposition and properties of quantum mechanical states. Although suitable mainly for the postgraduate students the book contains a number of advanced topics which are probably beyond the present postgraduate curriculum of the Indian Universities. The reviewer is particularly happy to note that the topic on second quantization which is usually treated in brief in many modern text books has been given careful and extensive consideration by the author. The author appears to concentrate more on the mathematical methods without using too complicated mathematics and the physics of quantum mechanics has been very skillfully demonstrated in the applications of the quantum mechanical methods for tackling various problems of atomic, nuclear, solid state and chemical physics. It is here and a few other topics where the book probably goes beyond the postgraduate level of the Indian Universities. The inclusion of topics like neutral K-mesons, Cooper pairs, Brillouin-Wigner perturbation theory, spin resonance, Clebsh-Gordan technique, irreducible tensor operators, spatially directed obritals, hydridization, Lamb shift etc, although extends the standard of the book to an advanced level mainly on the application side, will undoubtedly interest the new workers in the field of both theoretical physics and chemistry.

U. S. G.

Solenoid Magnet Design :

The magnetic and mechanical aspects of resistive and superconducting systems .

D. Bruce Montgomery, pp. 312, $ 13.95, 1969.

Wiley-Interscience, a division of John Wiley & Sons, New York.

The present volume deals with the design of magnets involving air core coils only. Such coils are divided into three categories, steady state dissipative coils, steady state non-dissipative (superconducting) coils and transient pulse field coils. The different relations between current and central field for coils of various shapes and distributions of currents have been developed as also the relations between current and other basic design parameters like energy, coil volume, magnetic stresses, cooling requirements and current density. The relations between the central field and fields at all other points have also been discussed from the stand point of analysis and synthesis. In addition to the formulae and design charts necessary for designing air core magnets, which are copiously incorporated in the book, it also includes a discussion of the relative importance of the design variables, through formulation, graphs and examples, which will evidently be of much use in particular design. It is obvious from above that the book is a highly useful one for designers of air core magnets.

The author of the book, a wellknown and experienced worker in the field and who has taken great pains in bringing out this volume, should certainly be congratulated.

A. K. D.

Glass Lasers

Edited by K. Patek.

Iliffe Publications, 1970, 217 pages, £ 6.50.

The book deals with the science of glass lasers. The treatment is balanced, clear and free from irrelevant details. Part 1 discusses electronic spectra of free and doped rare earth ions, energy transfers, non-radiative transitions, and some systematizations regarding structure of glasses. Mathematical deductions have been avoided in the discussion of theories, and the basic ideas and deduced results have been put in a concise form that will be very handy for experimental spectroscopists. The results on emission from doped glasses obtained upto 1967 have been summarized. Part 1 will be of general interest, while Parts 2 and 3 are meant for those connected with the development of optically-pumped lasers. In part 3 the emphasis has been on the theories behind the design of the glass laser that might help the research workers in this field.

M. C.